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ILC DOVER FREDERICA DE PROTECTIVE EQUIPMENT DIV
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VISOR OPTIMIZATION

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Final Report for Period 12 June 1979 -- 29 March 1980

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This task was authorized to redesign the visor closure tools on the DPE Outergarment in order to eliminate cutting of the vinyl visor material. The tooling was designed, fabricated and tested. It succeeds in preventing cutting of the vinyl visor material while maintaining the peel strength of the seam required per specification.		

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FOREWARD

The work reported herein was conducted by ILC DOVER, Frederica, Delaware, for ARRADCOM, CML/Ballistics Procurement, APG (Edgewood Area), Maryland in accordance with Contract DAAK11-79-C-0066, Task Order Number 5. Mr. Donald R. Cohee was the Program Manager for ILC DOVER. Mr. Wayne Davis was the Contract Monitor for the Chemical Systems Laboratory. This work was accomplished between 12 June 1979 and 29 March 1980.

This technical report has been reviewed and is approved.

Mr. David M. English, Chief
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INTRODUCTION

This task was authorized to redesign the visor tooling in order to eliminate cutting of the vinyl visor material while allowing heat seal machine time and power settings that will force a large extrusion.

COMPLETED ACTIVITY

The following work was performed during the completion of this task order:

- (1) The tooling redesign was completed. The vinyl cutting problem is eliminated by predetermining the desired heat seal thickness and incorporating it in the heat seal tool. The straight heat seal bar is held upright by a wide phenolic stand-off. The phenolic bar is slightly thicker than the aluminum bar. When two layers of 40-mil vinyl lie under the aluminum bar, however, it is higher than the phenolic. Therefore, the top platen contacts the aluminum first.

As heat sealing begins, the aluminum sinks into the vinyl until the platen bottoms on the phenolic. At this point the platen can travel no further, and the heat seal thickness is determined by the difference in heights between the phenolic and aluminum bars. By limiting the depth of penetration of the aluminum into the vinyl, the cutting is eliminated.

A lucite bar bolted to the aluminum bar on one side prevents spreading of the vinyl material on that side during heat sealing. This leaves little space for a bead to form, forcing most of the extruded material to form a large bead on the opposite side. This is desirable because the tool can be positioned to form the pronounced bead on the inside of the seam, where it is needed due to pressure loading. Also, it is a readily visible indication of a good seal.

- (2) Two (2) heat seal tools were fabricated and drawings made of each; a short tool for the top visor heat seal, and a long tool for the longer side visor heat seals. Seam samples made by the new tools were tested and found adequate per specification. ECP Number 80-0058-002 includes these tool drawings and test results.
- (3) All changes to the specification, tool drawings, and test results have been submitted with ECP Number 80-0058-002, proposing the implementation of the redesigned helmet closure tooling.

CONCLUSION

The redesigned visor closure tools are available for use in production of DPE Outergarments.